R. P. BARNSTEAD.

ELECTRIC WATER HEATER.

APPLICATION FILED JAN. 27, 1913.

1,143,568.

Patented June 15, 1915.

2 SHEETS—SHEET 1.

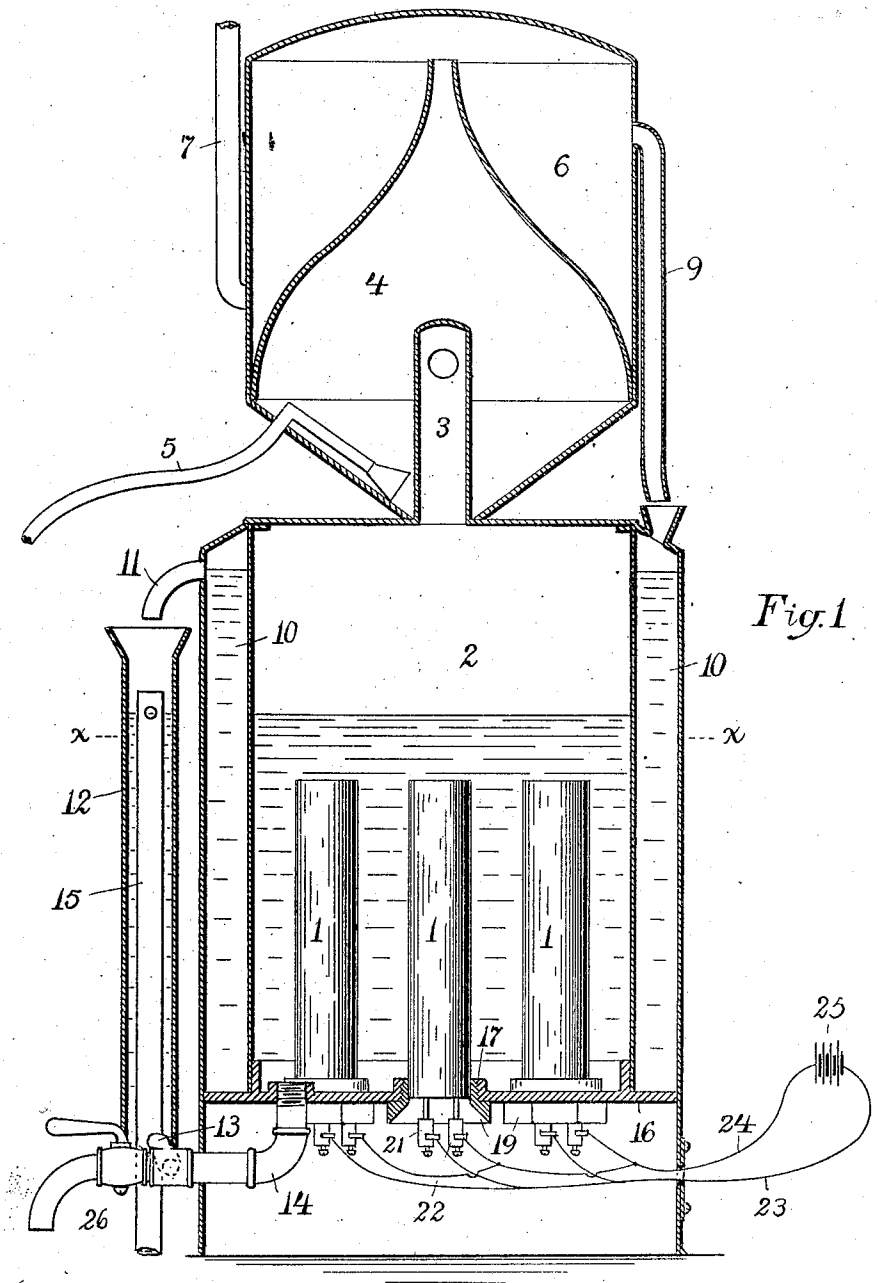


Fig. 1

Witnesses,

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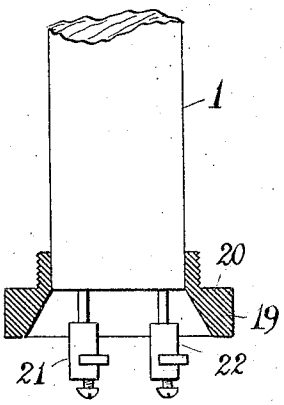


Fig. 3

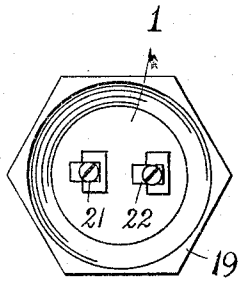
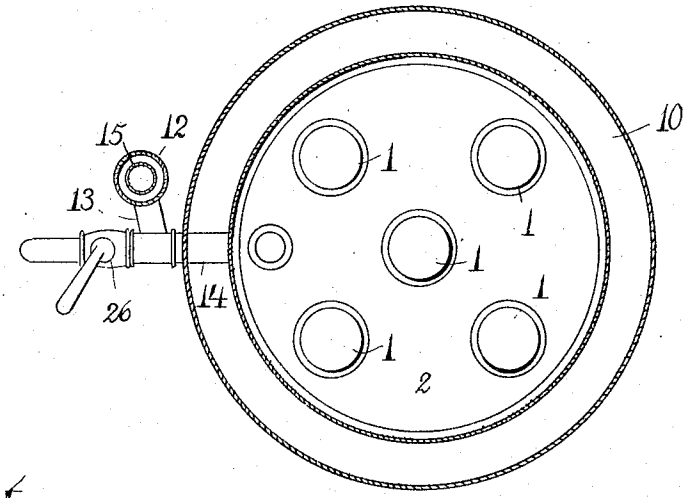


Fig. 4

Fig. 2



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UNITED STATES PATENT OFFICE.

ROBERT P. BARNSTEAD, OF BOSTON, MASSACHUSETTS.

ELECTRIC WATER-HEATER.

1,143,568. Specification of Letters Patent. Patented June 15, 1915.

Application filed January 27, 1913. Serial No. 744,331.

To all whom it may concern:

Be it known that I, ROBERT P. BARNSTEAD, a citizen of the United States, and residing at Boston, in the county of Suffolk and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Electric Water-Heaters, of which the following is a full and exact description.

This invention relates primarily to apparatus to be used in dwellings, hotels, hospitals and the like for the production of pure water by distillation; and my invention pertains first to improved means for enabling the water to be evaporated by electric heating cells, and, second, to certain improvements in details of construction hereinafter set forth.

Referring to the drawings forming part of this specification, Figure 1 is a central vertical section of a still embodying my improvements. Fig. 2 is a horizontal section of the same on the line X—X. Fig. 3 is a central vertical section of one of the cell-supporting sockets. Fig. 4 is an under view of the same.

As shown in Fig. 1, the electric heater cells 1 are supported within the evaporating chamber 2, from which the vapor passes up through the channel 3 to the condensing chamber 4; the water of condensation issuing from the latter through the pipe 5. The water for cooling the condensing chamber enters the cooling chamber 6 through a suitable supply 7, and the heated overflow escapes through the pipe 9 to the water jacket 10. From the water jacket, the water overflows through the nozzle 11 to the tube 12 which communicates at its lower end through a connection 13 and 14 to the evaporating chamber. Any excess of water overflows through the pipe 15 to the drain, and so prevents the water in the evaporating chamber from rising above the predetermined level. By having the overflow from the cooling chamber pass through the water jacket previous to its admission to the evaporating chamber, the water is brought nearly to the boiling point before such admission, and the amount of heat required for its evaporation is correspondingly reduced. Prior to my invention, the overflow from the cooling chamber passed directly to the tube 12 and thence to the evaporating chamber.

It has heretofore been the custom to insert the heater cells or units within a small cylinder. The great difficulty with such an arrangement was that the water being in contact with the outer surface of the cylinder or shell, and the heat from the heater unit having to pass both through the thickness of such shell and also through an air space between the shell and unit, a considerable waste of electric current was entailed for the desired amount of evaporation. By means of my improvement, I have reduced such current to a minimum. To do this, the floor 16 of the evaporating chamber is formed with several internally threaded holes 17, as shown in Figs. 1 and 2, adapted to receive the correspondingly threaded sockets 19, which are each formed with an overhanging shoulder 20 ground to fit watertight up against the under surface of said floor. In the upper part of each socket is soldered the lower end of a heater unit 1, as shown in Fig. 3, the distance of the units within the sockets being only just enough for strong and water-tight soldering. To make ample room for attaching the lead wires to the terminals 21, 22, the lower inner surface of each socket is chamfered away; said terminals being connected through suitable wires 23, 24 with a current-source 25. The periphery of each socket being made polygonal, as shown in Fig. 4, the same can be easily unscrewed or returned,—the water being, of course, first drawn off through the cock 26. Practically the entire outer surface of each heater unit is presented to the water, so that the warmth therefrom performs its desired task with the least possible delay and waste. Additional to the advantages above recited for the water jacket are these: It saves the heat otherwise dissipated from the surface of the chamber 2, and, finally, it prevents the still from getting burned out; for it sometimes happens that the current to the heater units is not turned off when the water supply to the cooler chamber 6 is shut off. Consequently after a time the entire water is evaporated from the chamber 2, and the heater units soon bring all connected metal parts to a temperature which melts the solder holding them together. But, by using the water jacket, from which the water can be but slightly evaporated, the temperature of said metal parts is held down by the water to a safe degree.

What I claim as my invention and for which I desire Letters Patent is as follows, to wit:

The combination with a liquid container

having a bottom formed with a threaded hole, of an electric heater unit having terminals at one end, and an annular socket receiving and supporting the end of said heater unit, said socket being formed with a shoulder of considerably greater diameter than the remaining portions thereof, said remaining portions being externally threaded to screw into said threaded hole, said shoulder being peripherally polygonal and internally conical, whereby said shoulder serves both as a means for forcibly screwing the socket into said hole, and as a wall to protect said terminals.

In testimony that I claim the foregoing invention, I have hereunto set my hand this 24th day of January, 1913.

ROBERT P. BARNSTEAD.

Witnesses:
A. B. UPHAM,
R. W. FROST.